DEEP LEARNING

Question 1

Which of these is the best definition of “Generative AI”?

1 / 1 point

Any web-based application that generates text.

A form of web search.

Artificial intelligence systems that can map from an input A to an output B.

AI that can produce high quality content, such as text, images, and audio.

Correct

Generative AI refers to a collection of tools that can generate high quality text, images, and audio, including large language models (LLMs) and diffusion models for image generation.

**2.**

Question 2

Which of these is the most accurate description of an LLM?

1 / 1 point

It generates text by repeatedly predicting words in random order.

It generates text by repeatedly predicting the next word.

It generates text by using supervised learning to carry out web search.

It generates text by finding a writing partner to work with you.

Correct

A Large Language Model (LLM) has been trained to repeatedly predict the next word using 100 billions - trillions of examples of text from the internet.

**3.**

Question 3

**True or False.** Because an LLM has learned from web pages on the internet, its answers are always more trustworthy than what you will find on the internet.

1 / 1 point

True

False

Correct

Because LLMs can hallucinate (make up facts), it is best to fact-check the response from an LLM before using it in situations where factual accuracy is important.

**4.**

Question 4

Why do we call AI a general purpose technology?

1 / 1 point

Because it is useful for many different tasks.

Because it can chat.

Because it includes both supervised learning and generative AI.

Because it can be accessed via the general web.

Correct

General purpose technologies are, by definition, designed to be versatile and useful for a wide range of tasks. This broad utility across various applications is what characterizes AI as a general purpose technology.

**5.**

Question 5

You hear of a company using an LLM to automatically route emails to the right department. Which of these use cases is it most likely to be?

1 / 1 point

The company has a software-based application that uses an LLM to automatically route emails.

Employees are copy-pasting the emails into a web interface to decide how to route them.

Correct

A software-based application that uses an LLM to automatically read and route emails can process many emails automatically as they are received. So it is most likely the company is using a software-based application to carry out this work.

Question 1

A friend writes the following prompt to a web-based LLM: “Write a description of our new dog food product.”

Which of these are reasonable suggestions for how to improve this prompt?

1 / 1 point

Give the LLM more context about what’s interesting or unique about the product to help it craft a better description.

Give it guidance on the purpose of the description (is it to go in an internal company memo, a website, a press release?) to help it use the right tone.

Specify the desired length of the description.

All of the above.

Correct

Providing as many details as you can about the task you are trying to carry out in the prompt helps the LLM generate a response that is closer to what you want.

**2.**

Question 2

Which of the following are tasks that LLMs can do? (Check all that apply)

1 / 1 point

Proofread text that you’re writing.

Correct

LLMs can be used for proofreading tasks on text that you are writing, like correcting spelling and grammar mistakes, and editing for length or clarity.

Summarize articles.

Correct

LLMs can take long texts as input and output shorter summaries of those texts.

Translate text between languages.

Correct

LLMs can produce high quality translations for widely-spoken languages that have lots of text on the internet (also known as “high resource” languages).

Earn a university degree (similar to a fresh college graduate).

**3.**

Question 3

Someone prompts an LLM as follows: “Please summarize each of this morning’s top 10 news stories in 100 words per story, in a manner suitable for a newsletter.” What is the main reason this is unlikely to work?

0 / 1 point

Asking for a list of 10 items means we’re working with structured data, which an LLM is poor at.

The prompt needs to give more context about what type of newsletter it is (tech, general news, etc).

Because of the knowledge cutoff, the LLM will not have access to the latest news.

The output length is limited, and 10 stories is too many.

Incorrect

While providing additional information and context in the prompt of an LLM can help the model produce better output, lack of information about the type of newsletter is not the main issue here. The main reason that the prompt won’t work is that the LLM’s knowledge of the world is frozen at the moment of its training, so it does not know about more recent events like today’s news.

**4.**

Question 4

You’re preparing a presentation about technology, and ask an LLM to help you find an inspirational quote. It comes up with this:

**And that’s what a computer is to me. What a computer is to me is it’s the most remarkable tool that we’ve ever come up with, and it’s the equivalent of a bicycle for our minds. -Steve Jobs**

How should you proceed?

1 / 1 point

Because LLMs hallucinate, double-check this quote by searching other sources (such as the web) to verify if Steve Jobs really said this.

Because LLMs can hallucinate, double-check this quote by prompting the LLM to ask if it is really sure Steve Jobs said this.

Do not use this quote because an LLM can generate toxic output.

LLMs have learned from text on the internet; so you can safely trust that this quote is found on multiple webpages, and use it in your presentation.

Correct

LLMs can generate authoritative sounding, but factually inaccurate text (a behavior known as “hallucinating”). It is important to double check its output when factual accuracy is important to your task.

**5.**

Question 5

You want an LLM to help check your writing for grammar and style. Which of these is the better approach for creating a prompt?

1 / 1 point

Don’t overthink the initial prompt -- quickly give it some context, then prompt the LLM to get its response, see what you get and iteratively refine your prompt from there.

Take all the time you need to carefully craft a prompt that gives it all the appropriate context, so that it works reliably the first time.

Correct

Prompting is a highly iterative process, and taking your initial idea, prompting the LLM, and then refining your prompt based on the model’s output is the most effective way to get to the output that you want.

Question 1

**True or False.** Because of the knowledge cut-off, an LLM cannot answer questions about today’s news. But with RAG to supply it articles from the news, it would be able to.

1 / 1 point

True

False

Correct

RAG provides an LLM with additional information and context from external documents that it can reason through to answer a question. So RAG would enable an LLM to answer questions about current news articles.

**2.**

Question 2

You want to build an application to answer questions based on information found in your emails. Which of the following is the most appropriate technique?

1 / 1 point

RAG, where the LLM is provided additional context based on retrieving emails relevant to your question.

Pretraining an LLM on your emails.

Fine-tuning an LLM on your emails, whereby we take a pre-trained LLM and further train it on your emails.

Prompting (without RAG), where we iteratively refine the prompt until the LLM gets the answers right.

Correct

RAG can be used to give an LLM access to new, external sources of information that it can reason through to formulate an answer to your question. So a RAG system that provides access to your emails is the best approach to get an LLM to answer your questions.

**3.**

Question 3

What does the idea of using an LLM as a reasoning engine refer to?

1 / 1 point

This refers to the idea of using an LLM not as a source of information, but to process information (wherein we provide it the context it needs, through techniques like RAG).

The idea of using an LLM to play games (like chess) that require complex reasoning, but having its output moves in the game.

Reasoning engine is another term for RAG.

This refers to pretraining an LLM on a lot of text so that it acquires general reasoning capabilities.

Correct

The ability of LLMs to process information is one of the features that makes them such powerful and useful tools.

**4.**

Question 4

**True or False.** By making trusted sources of information available to an LLM via RAG, we can reduce the risk of hallucination.

1 / 1 point

True, because the LLM is now restricted to outputting paragraphs of text exactly as written in the provided document, which we trust.

False, because giving the LLM more information only confuses the LLM more and causes it to be more likely to hallucinate.

True, because RAG allows the LLM to reason through accurate information retrieved from a trusted source to arrive at the correct answer.

False, because the LLM has learned from a lot of text from the internet (perhaps >100 billion words) to hallucinate, so adding one more short piece of text to the prompt as in RAG won’t make any meaningful difference.

Correct

RAG can be used to give an LLM access to new, trusted sources of information that it can reason through to formulate an answer to your question. This helps prevent the model from hallucinating because it doesn’t know the answer.

**5.**

Question 5

An ecommerce company is building a software application to route emails to the right department (Apparel, Electronics, Home Appliances, etc.) It wants to do so with a small, 1 billion parameter model, and needs high accuracy. Which of these is an appropriate technique?

1 / 1 point

Fine-tune a 1 billion parameter model on around 1 billion examples of emails and the appropriate department.

Pretrain a 1 billion parameter model on around 1 billion examples of emails and the appropriate department.

Pretrain a 1 billion parameter model on around 1,000 examples of emails and the appropriate department.

Fine-tune a 1 billion parameter model on around 1,000 examples of emails and the appropriate department.

Correct

Fine-tuning an existing model is an effective way to get it to learn how to correctly route emails to the specific departments in the ecommerce company. Fine-tuning can be done well with 1000 to 10,000 examples.

Which of these job roles are unlikely to find any use for web UI LLMs?

1 / 1 point

Marketer

Recruiter

Programmer

None of the above

Correct

All of the above roles carry out one or more tasks that could be augmented with a web UI LLM.

**2.**

Question 2

What is the relation between AI, tasks, and jobs?

1 / 1 point

Jobs are comprised of many tasks. AI automates tasks, rather than jobs.

Tasks are comprised of many jobs. AI automates tasks, rather than jobs.

Jobs are comprised of many tasks. AI automates jobs, rather than tasks.

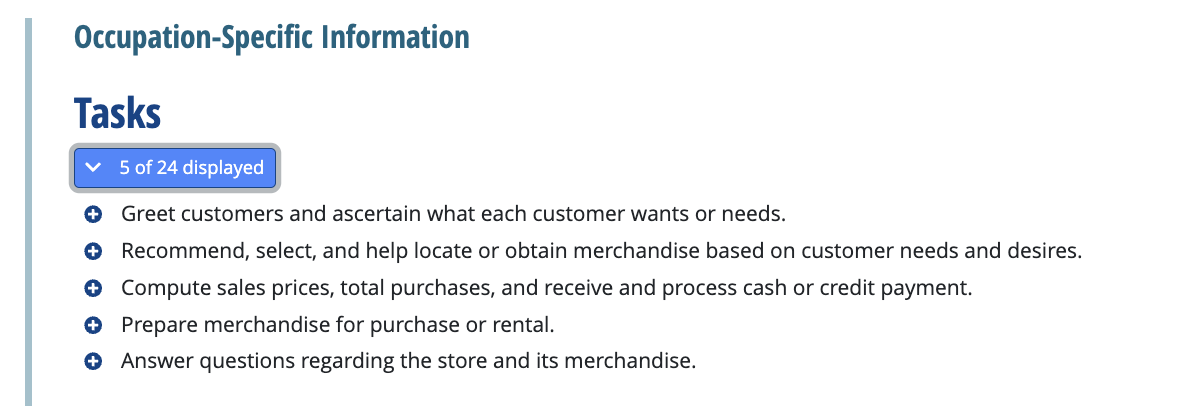
Tasks are comprised of many jobs. AI automates jobs, rather than tasks.

Correct

**3.**

Question 3

Here are some of the [tasks of a retail salesperson from O\*NET](https://www.onetonline.org/link/summary/41-2031.00). (We encourage you to check out the page yourself.)



Say we decide to use AI to augment (rather than automate) a salesperson's task of recommending merchandise to customers. Which of the following would be an example of this?

1 / 1 point

This has no business value and should not be done.

Build an AI system to suggest products to the salesperson, who then decides what to recommend to the customer.

Build a chatbot that automatically recommends products that customers can access directly, with no salesperson involved.

Build an AI chatbot that can role-play being a customer to help the salesperson practice having conversations with customers.

Correct

Here the AI is augmenting the work of the salesperson by making suggestions, rather than fully taking over and automating the task.

**4.**

Question 4

When looking for augmentation or automation opportunities, what are the two primary criteria by which to evaluate tasks for generative AI potential? (Check the two that apply.)

0.5 / 1 point

Whether the task is the iconic, defining task for a job role.

This should not be selected

Generative AI has the potential to augment or automate many of the tasks that make up a job role, not just the most iconic, defining task. You should evaluate the business value of all tasks in a role to determine the potential for generative AI augmentation of automation.

Whether to use prompting, RAG or fine-tuning.

Technical feasibility (can AI do it?).

Business value (how valuable is it to automate?).

Correct

Thinking about the time taken to complete a task, and the potential value in doing that task faster, cheaper, or more consistently, can help you assess the business value of AI augmentation or automation.

**5.**

Question 5

What is a quick way to start experimenting with an LLM application development project?

1 / 1 point

Forming a large team with specialized roles.

Try experimenting and prototyping with a web-based LLM to assess feasibility.

Hiring a dedicated prompt engineer.

Recruiting a large team of data engineers to organize your data.

Correct

Experimenting and prototyping with web interfaces is a viable way to get started with LLM application development. This allows you to understand what is feasible before investing more time and resources in growing the project and team.

Question 1

In the videos, we described using either supervised learning or a prompt-based development process to build a restaurant review sentiment classifier. Which of the following statements about prompt-based development is correct?

1 / 1 point

Prompt-based development is generally much faster than supervised learning.

Prompt-based development requires that you collect hundreds or thousands of labeled examples.

Prompt-based development requires that you collect hundreds or thousands of unlabeled examples (meaning reviews without a label B to say if it is positive or negative sentiment).

If you want to classify reviews as positive, neutral, or negative (3 possible outputs) there is no way to write a prompt to do so: An LLM can generate only 2 outputs.

Correct

Prompt-based development allows you to take advantage of an LLM’s ability to carry out sentiment classification, so you can get up and running very quickly because you don’t need to train a model from scratch.

**2.**

Question 2

What is a token in the context of a large language model (LLM)?

1 / 1 point

A unit of cryptocurrency (like bitcoin or other “crypto tokens”) that you can use to pay for LLM services.

The part of the LLM output that has primarily symbolic rather than substantive value (as in, “the court issued a token fine”, or “the LLM generated a token output”).

A physical device or digital code to authenticate a user's identity.

A word or part of a word in either the input prompt or LLM output.

Correct

Tokens in the context of LLMs refer to a unit of text. Common words are typically represented by a single token, while uncommon words may be broken into two or more tokens.

**3.**

Question 3

What are the major steps of the lifecycle of a Generative AI project?

1 / 1 point

Scope project → Build/improve system → Internal evaluation → Deploy and monitor

Scope project → Internal evaluation → Build/improve system → Deploy and monitor

Scope project → Internal evaluation → Deploy and monitor → Build/improve system

Correct

This sequence accurately represents the recommended steps in the lifecycle of a Generative AI project. You first scope the project, then build or improve the system, followed by internal evaluation, and finally, deployment and monitoring.

**4.**

Question 4

You are building a customer service chatbot. Why is it important to monitor the performance of the system after it is deployed?

1 / 1 point

Because of the LLM’s knowledge cutoff, we must continuously monitor the knowledge cutoff and update its knowledge frequently.

In case customers say something that causes the chatbot to respond in an unexpected way, monitoring lets you discover problems and fix them.

This is false. So long as internal evaluation is done well, further monitoring is not necessary.

Every product should be monitored to track customer satisfaction -- this is good practice for all software.

Correct

Users can be very creative in the ways they prompt chatbots, so monitoring the system can help you identify any issues with the chatbot’s output as they arise and allow you to improve the system in response.

**5.**

Question 5

You are working on using an LLM to summarize research reports. Suppose an average report contains roughly 6,000 words. Approximately how many tokens would it take an LLM to process 6,000 input words? (Assume 1 token = 3/4 words, or equivalently, 1 word \approx 1.333 tokens).

1 / 1 point

4,500 tokens (6000 \* 3/4)

6,000 tokens

8,000 tokens (about 6000 \* 1.333)

14,000 tokens (about 6000 \* 1.333 + the original 6000 words)

Correct

A token typically represents a single common word or a part of the word. This means that a word can represent anywhere between 1 or more tokens. Therefore, an LLM typically requires more tokens to process the input number of words.

Which of the following statements about Reinforcement Learning from Human Feedback (RLHF) are true?

1 / 1 point

After applying RLHF, an LLM will reflect a similar degree of bias and toxicity as text on the internet.

RLHF is a common technique for training a small (say 1B parameter) LLM to do as well as a larger (say 10B parameter) one.

RLHF helps to align an LLM to human preferences, and can reduce the bias of an LLM’s output.

RLHF fully addresses all concerns about AI.

Correct

RLHF trains models to produce output that better aligns with human preferences, including honesty, helpfulness, and harmlessness. The process can reduce biases in an LLMs output.

**2.**

Question 2

**True or False.** Because AI automates tasks, not jobs, absolutely no jobs will disappear because of AI.

1 / 1 point

True

False

Correct

Even if all of the tasks of a role can’t be completely automated, some jobs may be eliminated as efficiency increases and cost savings can be realized. It is important that we support the individuals who may lose their jobs through safety nets and by creating opportunities for retraining and upskilling.

**3.**

Question 3

If we manage to build Artificial General Intelligence (AGI) some day, which tasks should AI be capable of performing? (Check all that apply.)

1 / 1 point

Learn to drive a car in roughly 20 hours of practice.

Correct

By definition, AGI can carry out any intellectual task that a human can do. So it should be able to learn to drive a car in roughly 20 hours, just like a human teenager.

Compose the music for a movie soundtrack.

Correct

By definition, AGI can carry out any intellectual task that a human can do. So it should be able to create music for a movie soundtrack.

Write a software application to let users manage their household spending budgets.

Correct

By definition, AGI can carry out any intellectual task that a human can do. Since software applications like this already exist in the world, the AGI should be able to write one from scratch.

Predict the future (such as make stock market and weather predictions) with perfect accuracy.

**4.**

Question 4

You are working on a chatbot to serve as a career coach for recent college graduates. Which of the following steps could you take to ensure that your project follows responsible AI? (Check all that apply.)

1 / 1 point

Engage diverse recent college graduates and ask them to offer feedback on the output of your chatbot.

Correct

Working with diverse stakeholders can help you identify problems your own team may not recognize, and ensure that the behavior of your chatbot takes into account the perspectives of people from diverse backgrounds.

Organize a brainstorming session to identify problems that could arise for users chatting with the career coach.

Correct

Building a culture that encourages discussion and debate of ethical issues can help you identify problems early in the development phase and avoid issues of bias or toxicity later in the process.

Allow a single engineer on your team to determine whether the output of the chatbot is helpful, honest, and harmless.

Engage employers (because they are a key stakeholder group) and ask them to offer feedback on the output of your chatbot.

Correct

Working with all stakeholders can reveal points of view that your team may not have realized and can help identify problems or issues that may have been missed.

**5.**

Question 5

Now that you’ve made it to the end of the course, which of these statements are true? (Please check all, because all apply!)

1 / 1 point

You understand how Generative AI technology works, and what it can and cannot do.

Correct

You’re well positioned to use Generative AI responsibly to help yourself and others.

Correct

You’ve achieved the significant accomplishment of finishing this course.

Correct

Andrew is thrilled at your completing, and sends you his warmest thank you and congratulations!

Correct

Fill in the blanks: \_\_\_\_\_\_\_\_\_\_ involves using many prompt-completion examples as the labeled training dataset to continue training the model by updating its weights.  This is different from \_\_\_\_\_\_\_\_\_ where you provide prompt-completion examples during inference.

1 / 1 point

Prompt engineering, Pre-training

Instruction fine-tuning, In-context learning

In-context learning, Instruction fine-tuning

Pre-training, Instruction fine-tuning

Correct

**2.**

Question 2

Fine-tuning a model on a single task can improve model performance specifically on that task; however, it can also degrade the performance of other tasks as a side effect.  This phenomenon is known as:

1 / 1 point

Model toxicity

Catastrophic forgetting

Instruction bias

Catastrophic loss

Correct

**3.**

Question 3

Which evaluation metric below focuses on precision in matching generated output to the reference text and is used for text translation?

1 / 1 point

BLEU

HELM

ROUGE-2

ROUGE-1

Correct

BLEU focuses on precision and text translation while Rouge focuses on text summarization.

**4.**

Question 4

Which of the following statements about multi-task finetuning is correct? Select all that apply:

0.5 / 1 point

Multi-task finetuning can help prevent catastrophic forgetting.

Correct

Correct! However, remember that to prevent catastrophic forgetting it is important to fine-tune on multiple tasks with a lot of data.

FLAN-T5 was trained with multi-task finetuning.

Performing multi-task finetuning may lead to slower inference.

This should not be selected

This process only changes the parameters of the network, and therefore does not impact inference speed.

Multi-task finetuning requires separate models for each task being performed.

**5.**

Question 5

"Smaller LLMs can struggle with one-shot and few-shot inference:" Is this true or false?

1 / 1 point

True

False

Correct

Even when you include a couple of examples, smaller models might still struggle to learn the new task through examples.

**6.**

Question 6

Which of the following are Parameter Efficient Fine-Tuning (PEFT) methods? Select all that apply.

1 / 1 point

Subtractive

Selective

Correct

Selective methods is a category of PEFT that fine-tunes a subset of the original LLM parameters. It uses different approaches to identify which parameters to update.

Additive

Correct

Additive methods freeze all of the original LLM weights and introduce new model components to fine-tune to a specific task.

Reparameterization

Correct

Reparameterization methods create a new low-rank transformation of the original network weights to train, decreasing the trainable parameter count while still working with high-dimensional matrices. LoRa is a common technique in this category.

**7.**

Question 7

Which of the following best describes how LoRA works?

0 / 1 point

LoRA decomposes weights into two smaller rank matrices and trains those instead of the full model weights.

LoRA trains a smaller, distilled version of the pre-trained LLM to reduce model size

LoRA continues the original pre-training objective on new data to update the weights of the original model.

LoRA freezes all weights in the original model layers and introduces new components which are trained on new data.

Incorrect

LoRA doesn’t involve training a smaller, distilled version of the pre-trained LLM

**8.**

Question 8

What is a soft prompt in the context of LLMs (Large Language Models)?

1 / 1 point

A set of trainable tokens that are added to a prompt and whose values are updated during additional training to improve performance on specific tasks.

A strict and explicit input text that serves as a starting point for the model's generation.

A technique to limit the creativity of the model and enforce specific output patterns.

A method to control the model's behavior by adjusting the learning rate during training.

Correct

A soft prompt refers to aa set of trainable tokens that are added to a prompt. Unlike the tokens that represent language, these tokens can take on any value within the embedding space. The token values may not be interpretable by humans, but are located in the embedding space close to words related to the language prompt or task to be completed.

**9.**

Question 9

"Prompt Tuning is a technique used to adjust all hyperparameters of a language model." Is this true or false?

1 / 1 point

True

False

Correct

Prompt Tuning focuses on optimizing the prompts given to the model using trainable tokens that don’t correspond directly to human language. The number of tokens you choose to train, however, would be a hyperparameter of your training process.

**10.**

Question 10

"PEFT methods can reduce the memory needed for fine-tuning dramatically, sometimes to just 12-20% of the memory needed for full fine-tuning." Is this true or false?

1 / 1 point

True

False

Correct

By training a smaller number parameters, whether through selecting a subset of model layers to train, adding new, small components to the model architecture, or through the inclusion of soft prompts, the amount of memory needed for training is reduced compared to full fine-tuning.

 Which of these terms best describes the type of AI used in today’s email spam filters, speech recognition, and other specific applications?

* **Artificial Narrow Intelligence (ANI)**
* Artificial General Intelligence (AGI)

2. What do you call the commonly used AI technology for learning input (A) to output (B) mappings?

* Artificial General Intelligence
* Unsupervised learning
* **Supervised learning**
* Reinforcement learning

3. undefined  
You want to use supervised learning to build a speech recognition system. The figure above suggests that in order for a neural network (deep learning) to achieve the best performance, you would ideally use: (Select all that apply)

* **A large dataset (of audio files and the corresponding text transcript)**
* A small dataset (of audio files and the corresponding text transcript)
* **A large neural network**
* A small neural network

4. The only way to acquire data for a supervised learning algorithm is to manually label it. I.e., given the input A, to ask a human to provide B.

* True
* **False**

5. Which of these statements regarding data acquisition do you agree with?

* It doesn’t matter how data is acquired. The more data, the better.
* Only structured data is valuable; AI cannot process unstructured data.
* It doesn’t help to give data to an AI team, because they can always produce whatever they need by themselves.
* **Some types of data are more valuable than others; working with an AI team can help you figure out what data to acquire.**

6. You run a company that manufactures scooters. Which of the following are examples of unstructured data? (Select all that apply.)

* The maximum speed of each of your scooters
* The number of scooters sold per week over the past year
* **Audio files of the engine sound of your scooters**
* **Pictures of your scooters**

7. Suppose you run a website that sells cat food. Which of these might be a good result from a Data Science project? (Select all that apply.)

* **Insights into how to market cat food more effectively, depending on the breed of cat.**
* **A slide deck presenting a plan on how to modify pricing in order to improve sales.**
* A large dataset of images labeled as “Cat” and “Not Cat”
* A neural network that closely mimics how cats’ brains work.

8. Based on the terminology defined in Video 4, which of the following statements do you agree with? (Select all that apply.)

* **Deep learning is a type of machine learning. (I.e., all deep learning algorithms are machine learning algorithms.)**
* The terms “Machine learning” and “data science” are used almost interchangeably.
* AI is a type of deep learning. (I.e., all AI algorithms are deep learning algorithms.)
* **The terms “Deep learning” and “neural network” are used almost interchangeably.**

9. Which of these do AI companies do well?

* Strategic data acquisition
* Invest in unified data warehouses
* Spot automation opportunities
* **All of the above**

10. Say you want to input a picture of a person’s face (A), and output whether or not they are smiling (B). Because this is a task that most humans can do in less than 1 second, supervised learning can probably learn this A-to-B mapping.

* **True**
* False

## **Week- 2**

Week 2 Quiz

1. Machine learning is an “iterative” process, meaning that an AI team often has to try many ideas before coming up with something that’s good enough, rather than have the first thing they try work.

* **True**
* False

2. Say you want to use Machine Learning to help your sales team with automatic lead sorting. I.e., Input A (a sales prospect) and output B (whether your sales team should prioritize them). The 3 steps of the workflow, in scrambled order, are:

(i) Deploy a trained model and get data back from users

(ii) Collect data with both A and B

(iii) Train a machine learning system to input A and output B

What is the correct ordering of these steps?

* (i) (ii) (iii)
* **(ii) (iii) (i)**
* (ii) (i) (iii)
* (i) (iii) (ii)

3. What are the key steps of a Data Science project?

* Collect data
* Analyze the data
* Suggest hypothesis or actions
* **All of the above**

4. Machine Learning programs can help: (select all that apply)

* **Automate resume screening**
* **Automate visual inspection in a manufacturing line**
* **Customize product recommendations**
* **Automate lead sorting in sales**

5. Unless you have a huge dataset (“Big Data”), it is generally not worth attempting machine learning or data science projects on your problem.

* True
* **False**

6. Say you want to build an AI system to help recruiters with automated resume screening. Which of these steps might be involved in “technical diligence” process? (Select all that apply.)

* Ensuring that this is valuable for your business (e.g., estimating the project ROI)
* **Making sure that an AI system can meet the desired performance**
* **Making sure you can get enough data for this project**
* **Defining an engineering timeline**

7. Which of these statements about “business diligence” do you agree with?

* Business diligence applies only if you are launching new product lines or businesses.
* Business diligence is the process of ensuring that the envisioned AI technology is feasible.
* **Business diligence is the process of ensuring that the AI technology, if it is built, is valuable for your business**.
* Business diligence can typically be completed in less than a day.

8. You want to use supervised learning for automated resume screening, as in the example above. Which of the following statements about the Training Set are true? (Select all that apply.)

* The Training set and Test set can be the same dataset.
* It should give examples of the input A (resume) but not necessarily the desired output B (whether to move forward with a candidate).
* **It will be used by the AI team to train the supervised learning algorithm.**
* **It should give examples of both the input A (resume) and the desired output B (whether to move forward with a candidate).**

9. For your automated resume screening application, you are now providing a Test Set to the AI team. Which of the following statements about the Test Set are true? (Select all that apply.)

* It should give examples of the input A (resume) but not necessarily the desired output B (whether to move forward with a candidate).
* The Test Set should ideally be identical to the Training Set.
* **It should give examples of both the input A (resume) and the desired output B (whether to move forward with a candidate)**
* **It will be used by the AI team to evaluate the performance of the algorithm.**

10. Which of these are reasons that it’s often unrealistic to expect an ML system to be 100% accurate?

* You might not have enough data
* Data can be mislabeled
* Data can be ambiguous
* **All of the above.**

### Week- 3

Week 3 Quiz

1. Because smart speakers can carry out multiple functions (such as tell a joke, play music, etc.) it is an example of Artificial General Intelligence (AGI).

* True
* **False**

2. What are the key steps to a smart speaker function?

* Trigger detection -> intent recognition -> speech recognition -> command execution.
* Speech recognition → Trigger word detection -> intent recognition -> command execution.
* **Trigger word detection -> speech recognition -> intent recognition -> command execution.**
* Trigger word detection -> intent recognition -> speech recognition -> command execution.

3. Consider this system for building a self-driving car:

undefined  
The component for pedestrian detection is usually built using:

* Reinforcement learning
* A motion planning algorithm
* **Supervised learning**
* GANs

4. Suppose you are building a trigger word detection system, and want to hire someone to build a system to map from Inputs A (audio clip) to Outputs B (whether the trigger word was said), using existing AI technology. Out of the list below, which of the following hires would be most suitable for writing this software?

* AI Product Manager
* **Machine learning engineer**
* Data engineer
* Machine learning researcher

5. What is the first step in the AI Transformation Playbook for helping your company become good at AI?

* Build an in-house AI team
* **Execute pilot projects to gain momentum**
* Provide broad AI training
* Develop an AI strategy

6. Of the following options, which is the most important trait of your first pilot project?

* **Succeed and show traction within 6-10 months**
* Drive extremely high value for the business
* Be executed by an in-house team
* None of the above

7. Say you are building a smart speaker, and want to accumulate data for your product through having many users. Which of these represents the “Virtuous circle of AI” for this product?

Screenshot 315

8. Why is developing an AI strategy NOT the first step in the AI Transformation Playbook?

* The strategy should be to use the Virtuous Circle of AI, which comes after building a product.
* There is no reason. Developing an AI strategy IS the first step in the AI Transformation Playbook.
* When transforming a company into an AI company, one does not need a strategy, therefore it can’t be the first step.
* **Without having some practical AI experience and knowing what it feels like to build an AI project, a company usually does not know enough to formulate a sound strategy.**

9. According to the AI Transformation Playbook, broad AI training needs to be provided not only to engineers, but also to executives/senior business leaders and to leaders of divisions working on AI projects.

* **True**
* False

10. Which of the following are AI pitfalls to avoid? (Select all that apply)

* **Expecting AI to solve everything**
* **Expecting traditional planning processes to apply without changes**
* Pairing engineering talent with business talent to identify feasible and valuable projects.
* **Expecting AI based projects to work the first time**

### Week- 4

Week 4 Quiz

1. What are the current limitations of AI technology? (Select all that apply)

* **AI technology is susceptible to adversarial attacks**
* **AI technology can discriminate**
* **AI technology can be biased**
* There are no limitations to AI technology
* **Explainability is hard**

2. What is the Goldilocks Rule of AI?

* AI’s technology will continue to grow and can only benefit society
* One should allocate many resources to defend the world from giant killer robots
* An AI winter is coming
* **One shouldn’t be too optimistic or too pessimistic about AI technology**

3. Say you are building an AI system to help make diagnoses from X-ray scans. Which of the following statements about explainability of AI do you agree with?

* AI systems are intrinsically “black box” and cannot give any explanation for their outputs.
* **Lack of explainability can hamper users’ willingness to trust and adopt an AI system.**
* Most AI systems are highly explainable, meaning that it’s easy for a doctor to figure out why an AI system gave a particular diagnosis.
* Explainability is usually achieved through building a chatbot to talk to the user to explain its outputs.

4. Using current AI technology, if a machine learning system learns from text that reflects unhealthy biases/stereotypes, then the resulting AI software may also exhibit similarly unhealthy biases/stereotypes.

* **True**
* False

5. Using current AI technology, if a machine learning system learns only from text that is completely neutral and does not reflect any gender biases, then we would expect it to exhibit no, or at most minimal, gender bias.

* **True**
* False

6. Which of these are good practices for addressing bias in AI? (Select all that apply)

* Using an adversarial attack on the AI system to change its outputs to be less biased
* **Systematic auditing processes to check for bias**
* **Technical solution such as “zeroing out” bias**
* **Using more inclusive/less biased data**

7. Which of these are examples of adversarial attacks on an AI system? (Select all that apply)

* **Adding a sticker to a stop sign to make an AI system fail to detect it.**
* **Subtly modifying an audio clip to make a speech recognition system think someone said “Yes, authorized” when they actually said “No, reject.”**
* **Subtly changing an image to make an AI system mistakenly recognize a dog as a cat**.
* Using AI to synthesize a fake video of a politician saying something they never actually said.

8. If a developing economy has a strong and thriving coffee bean manufacturing industry (or some other vertical industry), then it has an advantage in applying AI to coffee bean manufacturing (or other vertical industry).

* **True**
* False

9. What are the jobs that AI is most likely to displace over the next several years?

* All jobs will be displaced
* **Jobs that comprise primarily of routine, repetitive work**
* Jobs that comprise primarily of non-routine, non-repetitive work
* Most jobs involving office work (white collar jobs)

10. Congratulations! You deserve a pat on the back for finishing this course.

* **True**
* False